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Range Conditions in New Mexico Based on Types of Vegetation and Grazing History

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Range Conditions in New Mexico Based on Types of Vegetation and Grazing History.

Types of Vegetation

New Mexico is possessed of a great diversity of types of vegetation, due primarily to differences in elevation, precipitation, temperature and length of growing season. Elevation ranges from slightly below 3000 feet in the lower valley of the Pecos River to well over 13,000 feet in the higher peaks of the Sangre de Cristo Range in the northern part of the state. Precipitation, the most important of the factors influencing the kind of vegetation, in general, increases with increase in elevation. The average annual rainfall varies from about 7 inches in the semi-desert regions to above 25 inches in the higher mountain country. Fortunately, over half the precipitation comes during the growing season so that many desirable range forage plants live and survive which would not otherwise do so. Length of growing season which is based on the number of days occurring between the last killing frost in the spring and the first killing frost in the fall varies from about 90 days in the higher, northern mountains to over 200 days in the Southern part of the State. The types of vegetation, as shown in figure - are: semi-desert shrub, semi-desert grass, short grass, oak shrub, woodland, forest and irrigated lands.

Semi-desert Shrub: This region is yearlong range and is confined largely to the counties of: Hidalgo, Luna, Dona Ana, Sierra Socorro, Otero and Eddy. The average rainfall is about 9 inches. The type covers the lower plains, mesas and river valleys. It consists principally of creosote

bush (Covillea tritentata), locally known as greasewood, black brush, (Flourensia cernua), mesquite (Prosopis glandulosa), soapweed (Yucca elata), and chamiza (Atriplex canescens). Where the latter plant occurs in abundance, grazing capacity is high when compared with the nearly worthless remainder which on the average requires over 150 acres to carry a cow yearlong. Other shrubs common to the type are: jujube (Zizyphus lycoides), acacia (Acacia constricta), ocotillo, (Fouqueria splendens), Spanish bayonet, (Yucca macrocarpa), desert willow (Chilopsis linearis), threadleaf sage (Artemisia filibolia) and screw bean locally known also as Tornillo (Stranbocarpa pubescens). Grasses are those listed for the semidesert grass type and may occasionally form extensive areas throughout the semidesert shrub. Soils are generally poor and shallow, being underlain with caliche which explains a good deal of the unproductiveness of the type. Annual weeds are sometimes abundant in the spring.

Semidesert grass: This type is confined largely to San Juan, Bernalillo, Valencia, Grant and the counties previously listed for semidesert shrub. Growing conditions are also the same as in the latter, consisting of such valuable grasses on the higher, dryer lands as: black grama (Boutelona eriopoda), the dropseeds (Sporabolus spp), bush muhly (Muhlenbergia porteri) its grazing capacity varies from 50 to 80 acres per cow yearlong. On flood flats and natural catchment basins, tabosa grass (Hilaria mutica), alkali sacaton (Sporobolus airoides) vine mesquite (Penicum obtusum) and burrograss (Scleropogon brevifolius) are important as summer - fall feed. Browse may be scattered or may occasionally be predominant in the semidesert grass type. The species are the same as those found semi-desert shrub.

Short grass: As a whole, this type comprises the best range land in the state. Grazing may be carried on yearlong. The type varies in

grazing capacity from about 20 to 60 acres, with an average of about 45 acres per cow yearlong. The principal range forage is blue grama (Boutelona gracilis). Other common constituents are buffalo grass (Buchlol dactylaides) (In the Eastern counties), black grama, hairy grama (Boutelona hirsuta), side oats grama (Boutelona curtipendula), ringgrass, a worthless species (Muhlenbergia torreyi), galleta grass, (Hilaria jamesii), red three-awn (Aristida longiseta), hairy triodia (Triodia pilosa), alkali sacaton and with annual weeds and small soapweed (Yucca glauca) in varying quantities. Considerable areas of the short grass type have deteriorated because of too heavy grazing to the half shrub made up principally of snakeweed with remnant species of grasses. It is poor in grazing capacity and many stockmen complain that ingestion of the plant in the spring causes abortion in cattle.

In Eastern New Mexico the tall grass type is common on loose sandy soils. As shown in figure - this is included within the short grass. No doubt at one time the tall grass was considerably more extensive than at present. Fire, overgrazing and dry farming have undoubtedly transformed much of this into a short grass type. The tall grass type is composed chiefly of the following species: "big bluestem" or feathergrass (Andropogon furcatus), "little bluestem" or prairie beardgrass (Andropogon scoparius), sidecats, blue, black and hairy gramas, lovegrass (Eragrostis sp), three awn grasses (Aristida sp), yucca (Yucca glauca), threadleaf sage (Artemisia filifolia) and annual weeds. The grazing capacity of the tall grass type is lower than the short grass, however, stockmen regard it highly in drought years and during severer winters.

Oak shrub: This type is confined to Southeastern New Mexico and is characterized by the low shrubby growth of shinnery oak (Quercus havardii). Other plants characteristic of the oak brush type are those described above for the tall grass type. The grazing capacity of shin oak country is generally estimated by stockmen at about half that of short grass country. Livestockmen suffer considerable losses some years from "shinnery oak poisoning". However, this is not serious enough to preclude the grazing of livestock in the type since most of the poisoning takes place during a short period in the spring, most losses can be prevented by moving the cattle to grass range or by supplemental feeding of alfalfa hay.

Woodland: This type is composed chiefly of pinan (Pinus edulis), juniper (Juniperus sp) and several of the evergreen oaks (Quercus Arizonica, Q.emoryi, Q.grisea). Range forage consists principally of blue grama, galleta, Texas timothy (Lycurus phleoides), sideoats, hairy and black gramas, muhly grasses (Muhlenbergia sp) and such browse species as: saltbush (Atriplex sp), beargrass (Nolina microcarpa) and willow (Salix sp). The type occurs from about 5000 up to about 75000'. Annual precipitation varies from 12 to 15 inches. Grazing is yearlong but years occur when losses from severe winter conditions are heavy. The average grazing capacity of the type is about 70 acres per cow yearlong.

Forest: Figure includes within forest land approximately all lands above 7500' elevation. Thus beginning at this altitude ponderosa or yellow pine (Pinus ponderosa) is the common timber species up to about 9000 feet when the type gives way to Douglas fir (Pseudotsuga taxifolia), white fir (Abies concolor), and quaking aspen (Populus tremuloides) which goes up to about 10,500 feet. In the upper limits Engelmann spruce (Picea engelmanni) is the common timber tree. Precipitation varies from 15 to 25 inches annually and the g rowing decreases markedly with increase in altitude so in the small areas above timber line (about 11,000 feet) it is less than 90 days. On a yearlong basis about 90 acres are required per cow in the forest type. This is used for grazing, however, only during the summer and early fall months.

Range forage species are: blue grama in the lower altitudinal limits, which gives way quickly to such bunch grasses as Arizona fescue or pinegrass (Festuca Arizonica), Mountain muhly (Muhlenbergia montana) and beardless pinegrass (Blepharoneuron tricholepsis) and various weeds. Common browse species are: Mountain mahogany (Carcocarpus montanus), wild currants (Ribes sp), antelope brush (Pueshia tridentata), thimbleberry (Rubus parviflorus) and willow. The latter occurs in stunted form on the highest mountain peaks which in general are covered only with such grass-like vegetation as the sedges (arex sp) and rusher (Juncus sp).

Irrigated lands:

Grazing History

The first livestock were brought into New Mexico in the year 1540 by Coronado. Costenada, the historian of the expedition, wrote at this time, "Who would believe that 1000 horses and 500 of our cows and more than 5000 rams and ewes and more than 1500 friendly Indians and servants in traveling over these plains (referring to the Great Plains country) would leave no more trace where they had passed than if nothing had been there - nothing - - - - ".

The missionary expeditions of Espejo in 1582 and Onate in 1598 brought livestock up the Rio Grande. Onate established missionaries in the upper Rio Grande above El Paso del Norte (now the City of El Paso, Texas) and these were versatile in livestock raising and agriculture. Stock raising was difficult due largely to lack of markets and the molestations of the Indians. However, the establishment of the missions should be regarded as the beginning of the livestock industry in the Southwest. Nearly all trade from New Mexico from this time on for over two hundred years was directed southward to Mexico. In 1807 Zebulon Pike visited El Paso and observed that he "put up at the house of Don Francisco Garcia, who was a merchant and planter. He possessed in the vicinity of the town 20,000 sheep and 1000 cows."

A decade or so later, in the period 1820 - 1845, hunters and trappers from the country east of the Missouri were establishing a fur trade in Northern New Mexico which led to a great increase in trade with the United States. Following the Mexican war and the settlement of the boundary dispute trade and industry in New Mexico continued to increase greatly with the formation of the territory in 1850. Under United States rule the cattle business, particularly in West Texas,

quickly expanded until there was vital need for a market. This was provided in 1866-1869 when cattle drives were inaugurated to the Kansas railheads. In the fall of 1862 Ft. Sumner, the present county seat of De Baca County was founded. The purpose of the military garrison was to control the Indians on the nearby Bosque Redondo Reservation where about 7000 Indians, principally Navajos and Mescalew Apaches were maintained until 1868 at which time the project was abandoned. However, during this short period, encouragement was given to bring in beef from West Texas. Settlement of Eastern New Mexico was further quickened by the Indian wars in the 70's with the Comanches in West Texas. Many cattlemen naturally went to country where the Indian depredations were least. Then in 1879 - 1883 the Texas Land Laws requiring leasing and fees forced many stockmen to seek the "free grass" of the territories of New Mexico and Arizona.

The era of the cattle trails ended in 1879 when the Atchison, Topeka and Santa Fe Railroad was completed to Las Vegas. The next five years saw the construction of over 12 hundred miles of railroad in New Mexico.

The following table indicates the growth of the sheep and cattle industries in New Mexico during the period 1850 - 1935

Copy Table I, page 20 - New Mex. Agr. Bul. #159.

It is evident that the cattle and sheep industries of New Mexico are of paramount importance to its well-being and that the grass lands of the State are therefore its most important resource. The acreage of grazing land in the State is many times greater than that upon which cultivated crops of all kinds are grown. To conserve and maintain these lands in a state of productivity is a problem which not only concerns the rancher thereon but also every citizen of the State who is interested in the civic welfare and the welfare of generations to come.

Unfortunately, a large proportion of the grazing lands in the State are in a more or less seriously depleted condition. Much of our range land has deteriorated so that these lands now carry only a fraction of the cattle which they formerly carried. Particularly is this true along the watercourse of the Rio Grande where the range lands have been in use by domestic livestock since the time of early Spanish settlements. However, other areas in the State have also suffered materially, particularly during the last forty-five years. Records show that our range lands today carry only about 75 percent of what they did in 1890. Range decline, or why pastures run out, may be due to any of the following causes, or as is more likely the case, a combination of these:

First, overgrazing, which may be brought about by any of the following causes: overstocking, that is, more stock than the range will carry; wrong kind of stock, for example, grazing sheep on range best suited for cattle or vice versa; poor handling of stock; improper season of use, such as grazing summer range too early in the spring or using winter range during the summer; and improper distribution of the stock.

Second, drought.--In so far as precipitation is concerned, the southwestern climate is extremely erratic with ever recurring periods or cycles of drought which as yet cannot be satisfactorily predicted.

During the recent drought of 1933-1934, 20 to 70 percent of the black grama grass in Southern New Mexico died through lack of water. In the more humid areas of the State, 10 to 40 percent of the blue grama grass was lost.

Third, rodents.--Observation has shown that in an average poor year of precipitation on average range land, rodents such as rabbits, kangaroo rats, and prairie dogs will consume about 20 percent of the grass forage produced. Moreover, on seriously depleted range lands, rodents alone can prevent the restoration of these lands to their former productivity.

Fourth, other factors.--Such factors as cultivation of areas unsuited for anything but grazing; construction of roads, trails, railroad grades, and logging operations locally play their part. However, grass and brush fires often destroy large amounts of forage and frequently in themselves bring about range depletion in many areas.

Among the measures planned for the improvement of the grazing ranges of New Mexico are those concerned with the reestablishment of a better forage cover. Two main methods are open. First, bringing back the better, naturally occurring range plants by favoring seed production; and second, by seeding the ranges with suitable native or introduced forage plants.

The first method, that of bringing back the better naturally occurring range plants by favoring seed production, offers one of the most expedient and practical means of revegetating our range lands.

This is natural reseeding and may be accomplished by the system known as deferred and rotation grazing. This means dividing the range into from three to five units whereby one of these units each year is protected from grazing until the plants have produced seed. Each year a new unit is rested until the entire ranch holding has been grazed in rotation. This system of grazing has given excellent results, for it allows the seed of the better forage species to be planted, thereby renewing the waning range.

Best results from deferred and rotation grazing are procured on lands which in the past have not been seriously depleted by overgrazing. However, many ranges have been and still are so heavily overstocked that the grazing capacity has progressively been reduced. Lands that once produced an abundant forage crop of highly palatable and nutritious blue grama grass now yield only meager amounts of unpalatable grasses such as burro grass and needle grass and weeds such as snakeweed and Russian thistle. Deferred and rotation grazing provides for this in that areas or units seriously depleted are protected from grazing the season through and the grazing is rotated according to a definite plan whereby each year the more seriously depleted areas are gradually encouraged to produce better forage.

The deferred and rotation system is especially suited for sheep outfits in as much as the flocks are controlled by the herder and do not require fencing. Obviously many New Mexico cattle ranchers cannot use the deferred and rotation system because at present a good many of these ranches are not adequately fenced. It is also obvious that this system, or for that matter any other system, will not work where the range is heavily overstocked.

This brings up the question of rate of stocking, or in other words, how many stock shall we carry on our ranges. Here in the Southwest it is evidently impractical to stock ranges on the basis of the worst drought years. Stocking on the basis of the best years has proved to be a suicidal policy, as many stockmen know from sad experience. Ranges should be stocked on the basis of an average or slightly below average year, and when the dry years come, the numbers of stock should be reduced by close culling, and if practicable supplemental feed should be supplied the remainder. Where deferred and rotation grazing is not practicable on the yearlong ranges of the Southwest, it has been found that continual moderate grazing is best. On many ranches this will mean reduction in numbers of stock, which in turn will not necessarily mean reduced returns. Studies at the United States Range Livestock Experiment Station near Miles City, Montana, show that a higher calf crop, heavier calves, and hence more pounds of meat were produced on a conservatively grazed range than on one which was as little as 25 percent overstocked. Similar studies at the New Mexico Agr. Exp. Station indicate much the same results.

The second main method of improving our grazing ranges, as stated previously, is that of seeding with suitable native or introduced forage plants; in other words, artificial reseeding. Unfortunately, this method of rejuvenating the range has not met with great success in the Southwest, not only because of the large areas involved and the low land values, but also because of the high cost of this method. However, artificial revegetation is the only method whereby we can restore a good many of our ranges. This is particularly true on areas where the desirable forage species have been removed or destroyed by cultivation for dry farming areas or by continued grazing abuse. On such areas rodent

control by poisoning and hunting will be absolutely necessary before any improvement can be attained by artificial revegetation or by protection from grazing. Experiments to date show that the most promising species for use in artificial reseeding in New Mexico are the native forage species such as blue grama, side-oats grama, Texas curly mesquite grass, winter fat, and chamiza. On most ranches seed of these can be gathered and sown at low cost by ranch workers who are necessarily idle in the slack seasons of the year.

NEW MEXICO STATE COLLEGE
OF AGRICULTURE AND MECHANIC ARTS
STATE COLLEGE, NEW MEXICO

DEPARTMENT OF AGRICULTURAL ECONOMICS

January 28, 1938

Mr. Kenneth Parker
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University of Arizona
Room 304, Agricultural Bldg.
Tucson, Ariz.

Dear Parker:

I was very much pleased to receive your map, together with the write-up, and feel that it will make a very distinct addition to our Type of Farming bulletin. I also believe that the classification of vegetation types is a more practical one than we have had heretofore. I certainly wish to express my appreciation for this work and deem it a personal favor for you to have gone to all of this trouble.

Meaning and reference to present connections. W.W.P.

In publishing the material we will be careful to follow the instructions with regard to recognition. The Extension Service has run off some copies which are not black line prints. I will send you two of these and later when I obtain better copies I will keep you in mind.

Thanking you again for your efforts in our behalf and hoping that we will be able to accomodate you in the future, I am,

Very truly yours,

P. W. Cockerill

P. W. Cockerill, Head
Agricultural Economics Dept.

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